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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,352	03/30/2004	Kangguo Cheng	FIS920030369US1 (17141)	4990
23389	7590	03/20/2006	EXAMINER	
SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA SUITE 300 GARDEN CITY, NY 11530			LANDAU, MATTHEW C	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 03/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/813,352

Applicant(s)

CHENG ET AL.

Examiner

Matthew Landau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10 is/are rejected.
- 7) ☒ Claim(s) 8 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/30/2004
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Group I, claims 1-10, in the reply filed on January 11, 2006 is acknowledged.

Claims 11-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Claim Objections***

Claims 1 and 6 are objected to because of the following informalities:

Regarding claim 1, it is suggested the limitation "A memory array comprises:" be changed to "A memory array comprising: ~~comprises~~:"

Regarding claim 6, the limitation "said at least one second-type memory cell" lacks sufficient antecedent basis in the claim.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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Claims 1, 5, 6, and 10 are rejected under 35 U.S.C. 102(a) as being anticipated by the admitted prior art.

Regarding claim 1, Figure 1 of the instant application (the admitted prior art (APA)) discloses a first type-memory device 14 (left side), the first-type memory device comprising a first transistor 10 and a first underlying capacitor 20 that are in electrical contact to each other through a first buried strap 15, said first buried strap positioned on a first collar region (not labeled); and a second-type memory device 14 (right side) comprising a second transistor 10 and a second capacitor that are in electrical contact to each other through an offset buried strap 15, said offset buried strap positioned on a second collar region, wherein said second collar region has a length equal to said first collar region. Note that the first and second buried straps are offset in the sense that they are spaced apart from each other.

Regarding claim 5, Figure 1 of the instant application discloses a support region (the substrate).

Regarding claim 6, Figure 1 of the instant application discloses both the first and second-type devices are in trenches.

Regarding claim 10, Figure 1 of the instant application discloses the first underlying capacitor 20 and the second underlying capacitor 20 have a vertical orientation.

Claims 1 and 2 are rejected under 35 U.S.C. 102(a) as being anticipated by Jang (US PgPub 2003/0132438).

Regarding claim 1, Figure 9 of Jang discloses a first type-memory device (far left trench), the first-type memory device comprising a first transistor and a first underlying capacitor that are in electrical contact to each other through a first buried strap 132/132a, said first buried strap positioned on a first collar region 122a; and a second-type memory device (far right trench) comprising a second transistor and a second capacitor that are in electrical contact to each other through an offset buried strap 122a, said offset buried strap positioned on a second collar region, wherein said second collar region has a length equal to said first collar region. Note that the first and second buried straps are offset in the sense that they are spaced apart from each other.

Regarding claim 2, Figure 9 of Jang discloses another type memory device (one of the middle trenches) comprising another transistor and another underlying capacitor that are in electrical contact to each other through a further-offset buried strap 132/132a, said further-offset buried strap positioned on another collar region 122a; wherein said another collar region has a length equal to said second and first collar regions.

Claims 1, 4-6, and 10 are rejected under 35 U.S.C. 102(a) as being anticipated by Mandelmann et al. (US Pat. 6,605,838, hereinafter Mandelmann).

Regarding claim 1, Figure 1 of Mandelmann discloses a first type-memory device 14 (left side), the first-type memory device comprising a first transistor 18 and a first underlying capacitor 16 that are in electrical contact to each other through a first buried strap 34, said first buried strap positioned on a first collar region 32; and a second-type memory device 14 (right side) comprising a second transistor 18 and a second capacitor 16 that are in electrical contact to

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each other through an offset buried strap 34, said offset buried strap positioned on a second collar region, wherein said second collar region has a length equal to said first collar region. Note that the first and second buried straps are offset in the sense that they are spaced apart from each other.

Regarding claim 4, Figure 1 of Mandelmann discloses said first underlying capacitor 16 comprises a first-bottling region and said second underlying capacitor comprises a offset bottling region.

Regarding claim 5, Figure 1 of Mandelmann discloses a support region (substrate 10).

Regarding claim 6, Figure 1 of Mandelmann discloses each memory device is formed within a trench.

Regarding claim 10, Figure 1 of Mandelmann discloses each capacitor has a vertical orientation.

Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by Hsu et al. (US Pat. 6,570,207, hereinafter Hsu).

Regarding claim 1, Figures 10 and 11 of Hsu discloses a first type-memory device 10c, the first-type memory device comprising a first transistor 25C and a first underlying capacitor 26 that are in electrical contact to each other through a first buried strap 27, said first buried strap positioned on a first collar region 34; and a second-type memory device 10 comprising a second transistor and a second capacitor 17 that are in electrical contact to each other through an offset buried strap 13, said offset buried strap positioned on a second collar region 18, wherein said

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second collar region has a length equal to said first collar region. Note that the collar length on the right side of device 10C is the same as the collar length on the right side of device 10.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu.

Regarding claim 3, Hsu does not specifically disclose the offset between the first buried strap region and the second buried strap region is from about 0.4 microns to about 0.6 microns. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hsu by selecting a value within the claimed range, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mandelmann.

Regarding claim 7, Mandelmann does not specifically disclose the first and second trenches have a depth between 1 and 10 microns. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Mandelmann by

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selecting a depth value within the claimed range, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

### ***Allowable Subject Matter***

Claims 8 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.


The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private or Public PAIR. Status information for unpublished



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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should any questions arise regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Matthew C. Landau

March 15, 2006